

# **US NAVY FORWARD LABORATORY IN FIRST GULF WAR , FINDINGS AND IMPLICATIONS FOR GWI.**

**Presentation to the  
Research Advisory Committee on Gulf War Veterans Illnesses  
September 21, 2022**

**By**

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Bethesda MD 20184 (1989-1991)**



# NAMRU-3 CAIRO EGYPT 1947- 2019 US NAVY BSL-3 FACILITY



For Security Reasons Moved  
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## NAMRU-3 CAIRO EGYPT DISEASE SURVEILLANCE MISSION FOR AREA



**WORKED WITH EGYPTIAN  
MOH, PUBLISHED OVER 40  
PAPERS WITH VARIOUS  
COUNTRIES MOH'S AND  
HEALTHCARE WORKERS**

**INFECTIOUS DISEASE  
SURVEILLANCE:  
HIV, HEPATITIS, FLU,  
DENGUE, MALARIA,  
SHIGELLA, P-ECOLI,  
SALMONELLA,  
CHOLERA, PARASITES,  
SHISTOSOMIASIS,  
LEISHMANIASIS, ETC.  
EBOLA, CONGO  
CRIMEAN, RIFT,  
MARBURG, LASSA,  
CHIKUGUNYA, WEST  
NILE, SANDFLY FEVER ,**

### **Some Accomplishments:**

- **Designated WHO HIV Reference Center for Eastern Med Region**
- **Set up HIV/ other screening in 7-8 countries**
- **Ran HIV Mideast Training Center**

# NAVY FORWARD LAB

AUGUST 1990- FEB 1991



In Theatre

Reported to **US Naval Forces Command (NAVCENT)**

**NAMRU-3 and US Navy Environmental and Preventative Medicine Unit No 7 (Naples Italy) Provided Personnel and Equipment.**

Support from out of theater:

Naval Medical Research Institute (NMRI)

Armed Forces Research Institute of Medical Sciences (AFRI)

US Army Medical Research Institute of Infectious Diseases (AMRIID)

Walter Reed Army Institute of Research (WRAIR)

NIH

Naval Research Laboratory (NRL)

**Chemical Biologic Defense Establishment, Porton Down UK**

**\*Complete Infectious Disease Identification “**

**\*Immunologic based assays for detecting bacterial or viral antigens and antibodies including all suspected BW agents**

**\*Molecular Techniques like Polymerase Chain Reactions**

Diarrheal disease agents  
 Enterotoxigenic *E. coli*  
*Shigella* sp.  
*Salmonella* sp.  
*Vibrio* sp.  
 Cryptosporidium  
 Rotavirus  
 Intestinal ova and parasites

Viral disease  
 Sandfly fever (Naples and Sicilian)  
 West Nile fever  
 Rift Valley fever  
 Crimean-Congo hemorrhagic fever  
 Sindbis  
 Dengue  
 Haatan  
 Hepatitis A and B

Rickettsial fevers  
 Q fever  
 Murine typhus  
 Mediterranean spotted fever

Respiratory diseases  
*Legionella pneumophila*  
*Mycoplasma pneumoniae*  
 Influenza virus A and B/parainfluenza 1,2,3  
 Respiratory syncytial virus  
 Adenovirus  
*Streptococcus* sp. and *Neisseria* sp.

Miscellaneous agents  
 Malaria  
*Yersinia pestis*  
*Francisella tularensis*

# IRAQI BW AGENTS OF CONCERN

- The **Al Hakum** facility began mass production of weapons-grade anthrax in 1989, eventually producing 8,000 liters or more
- Several species of bacterial pathogen, including Bacillus anthracis, Clostridium botulinum and Clostridium perfringens (gas gangrene)
- Several viruses (including enterovirus 17 [human conjunctivitis], rotavirus and camelpox).
- Purified biological toxins, such as botulinum toxin, ricin and aflatoxin.<sup>[7]</sup>

**After 1995, it was learned that Iraq had produced ,**

- **19,000 liters of concentrated botulinum toxin** (nearly 10,000 liters filled into munitions),
- **8,500 liters of concentrated anthrax** (6,500 liters filled into munitions)
- **2,200 liters of aflatoxin** (1,580 liters filled into munitions).<sup>[8]</sup>
- **In total, the program grew a half million liters of biological agents.**<sup>[9]</sup>
- **US Deployed aircraft to continually concentrate air samples over the theatre, for NFL to analyze.**
- **Any positives reported immediately NAVCENT/CENTCOM, then flown back to USAMRIID for verification..**

6. Block, S. M. (2001, January–February). The growing threat of biological weapons Archived 2008-12-27 at the Wayback Machine, American Scientist, 89:1. Retrieved November 17, 2008.

<sup>7</sup> Woods, Lt Col Jon B. (ed.) (April 2005). USAMRIID's Medical Management of Biological Casualties Handbook (PDF) (6th ed.). Fort Detrick, Maryland: U.S. Army Medical Institute of Infectious Diseases. p. 8. Archived from the original (PDF) on 2007-06-09. {{cite book}}: |author= has generic name (help)

8. Woods, *Op. cit.*, pg 8

9. Block, *Op. cit.*

## GENERAL FINDINGS

- **Diarrheal disease was the major infectious**
- **Approximately 60% of troops experienced at least one episode of acute diarrhea.**
- **Cause was enterotoxigenic Escherichia coli and Shigella, that were resistant to trimethoprim-sulfamethoxazole, tetracycline, or ampicillin**
- **NFL deployed quinolone ( Ciprofloxacin) drugs, which helped preserve combat readiness.**
- **Bleed 1000 Marines before and after for seroconversions , nothing significant**

**NAMRU-3 AND NPMU NO 7 PERSONELL PROVIDED  
COMPREHENSIVE INFECTIOUS DISEASE AND  
BIOWARFARE AGENT DETECTION TECHNOLOGY ON  
THE FRONT LINES FOR DESERT SHIELD /DESERT  
STORM 1990-1991**

Mil Med. 1993 Nov;158(11):729-32.

**The Navy Forward Laboratory during Operations Desert  
Shield/Desert Storm.**

Hyams, Bourgeois, Escamilla, Burans,  
Exceptional Navy Medical Officers.

Hyams KC<sup>1</sup>, Bourgeois AL, Escamilla J, Burans J, Woody JN.

➕ **Author information**

**Abstract**

The Navy Forward Laboratory (NFL) was an advanced infectious disease laboratory which provided a theater-wide reference diagnostic capability during Operations Desert Shield/Storm. During Operation Desert Shield, when massive numbers of troops were being deployed, the NFL primarily supported medical personnel in the diagnosis and treatment of infectious diseases. During the war, the laboratory provided rapid biologic warfare diagnostic support. The NFL demonstrated the benefits of a comprehensive, on-site diagnostic laboratory when large numbers of troops are deployed to high-risk areas and demonstrated the importance of military medical research laboratories for training of scientists and physicians, threat assessment, and product development.

**NMR&DC awarded Marine Corps Meritorious Service Medal**

## GULF WAR ILLNESS (GWI)

- **High frequency of unexplained health problems,**
- **across multiple biologic systems, as well as overall poor health**
- **amongst Gulf War Veterans**
- **Exposures:**
  - **Multiple Vaccinations**
  - **Pyridostigmine**
  - **Sarin/ Cyclo-Sarin gas**
  - **Depleted uranium**
  - **Smoke from burning oil wells**
  - **Burn Pit Exposures**
  - **Insecticides**
  - **Horrific Events**

# SUMMARY OF GWI

- GWI is a high frequency of unexplained health problems, across multiple biologic systems, as well as overall poor health amongst Gulf War Veterans
- Exhaustive studies have not identified a unifying etiology
- Epidemiology is well studied
- New insights are being gained into the psychological issues
  - VA PTSD Brain Bank- enormous resource
  - Rna/Dna/ Proteomics analysis provide therapeutic targets to test
  - Novel Brain receptor diagnostic probes provide insights
- Worldwide Issues of CNS Depressive and Cognitive diseases are Challenging
  - Major Depressive Disorder ( MDD)
  - PTSD
  - Alzheimer's
  - Parkinson's
  - Autism

# SOME FINDINGS FOR THE NAVY FORWARD LAB

38. [The impact of infectious diseases on the health of U.S. troops deployed to the Persian Gulf during operations Desert Shield and Desert Storm.](#)

**Hyams KC**, Hanson K, Wignall FS, Escamilla J, Oldfield EC 3rd.  
Clin Infect Dis. 1995 Jun;20(6):1497-504. Review.

PMID: 7548499

[Similar articles](#)

## Resolving Disputes About Toxicological Risks During Military Conflict: The US Gulf War Experience

Hyams, Kenneth C<sup>1</sup>; Brown, Mark<sup>1</sup>; White, David S<sup>2</sup>

### ▼ Author Information

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Correspondence and offprints: Dr *Kenneth C. Hyams*, Department of Veterans Affairs, Office of Public Health and Environmental Hazards, VA Central Office (13A), 810 Vermont Avenue NW, Washington, DC, 20420, USA.

## MOP GEAR STRESSORS

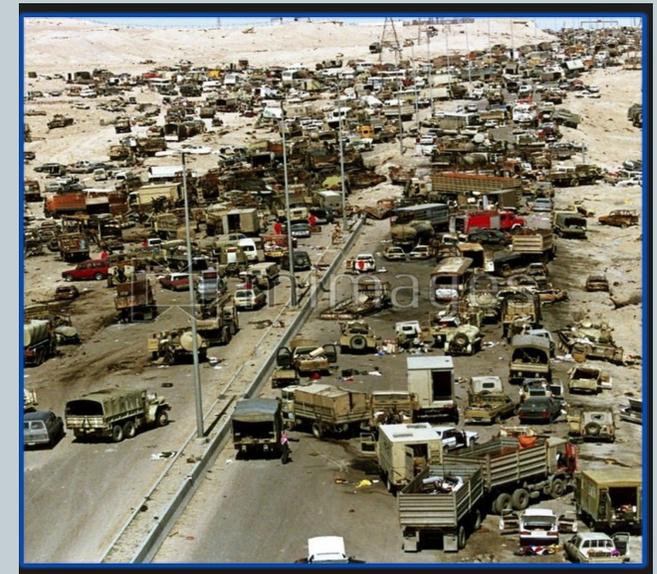
American troops prepared for every scenario since Iraq was known for employing chemical weapons in the past.



## ENVIRONMENTAL TOXIN EXPOSURES



## HORRIFIC EVENTS



# AVAILABLE INFORMATION

Vol I , 2000 to Volume 10 ,2016

**1996**

## Presidential Advisory Committee on Gulf War Veterans' Illnesses: Final Report

edited by Joyce C. Laslof, Marguerite Knox, John

D Baldeschwieler

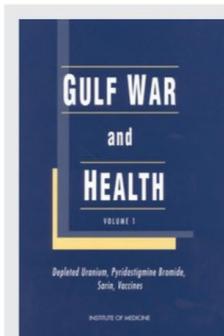
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ISBN 978-0-309-07178-9 | DOI 10.17226/9953

### CONTRIBUTORS

Carolyn E. Fulco, Catharyn T. Liverman, Harold C. Sox, Editors, Committee on Health Effects Associated with Exposures During the Gulf War, Division of Health Promotion and Disease Prevention

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Section Editor: [David Brent, MD](#)  
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### [Contributor Disclosures](#)

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Literature review current through: Apr 2019. | This topic last updated: Jan 04, 2018.

# RESEARCH PROGRESS : VA BRAIN BANK ENORMOUS ASSET

J Neurosci Res. 2019 Mar;97(3):292-299. doi: 10.1002/jnr.24306. Epub 2018 Aug 23.

## Molecular and cellular studies of PTSD: Postmortem transcriptome analysis and novel therapeutic targets.

Duman RS<sup>1</sup>, Girgenti MJ<sup>1</sup>.

[+ Author information](#)

### Altered metabotropic glutamate receptor 5 markers in PTSD:

### In vivo and postmortem evidence.

**Holmes SE**, Girgenti MJ, Davis MT, Pietrzak RH, DellaGioia N, Nabulsi N, Matuskey D, Southwick S, Duman RS, Carson RE, Krystal JH, Esterlis I; Traumatic Stress Brain Study Group.

Proc Natl Acad Sci U S A. 2017 Aug 1;114(31):8390-8395. doi:

10.1073/pnas.1701749114. Epub 2017 Jul 17. Erratum in: [Proc Natl Acad Sci U S A. 2017 Sep 5](#);.

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### In vivo evidence for dysregulation of mGluR5 as a biomarker of suicidal ideation

Margaret T. Davis, Ansel Hillmer, Sophie E. Holmes, Robert H. Pietrzak, Nicole DellaGioia, Nabeel Nabulsi, David Matuskey, Gustavo Angarita-Africano, Richard E. Carson, John H. Krystal, and Irina Esterlis

# KETAMINE

- Glutamate is the major excitatory transmitter for Brain function
- Ketamine blocks the NMDA receptor channel for glutamate
- Analog of PCP... “Special K”
- Clinical Trials in Major Depressive Disorder (MDD) and PTSD encouraging

## Ketamine: A Paradigm Shift for Depression Research and Treatment

John H. Krystal,<sup>1,2,3,\*</sup> Chadi G. Abdallah,<sup>1,2</sup> Gerard Sanacora,<sup>1,3,4</sup> Dennis S. Charney,<sup>5</sup> and Ronald S. Duman<sup>1,2,4</sup>

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<https://doi.org/10.1016/j.neuron.2019.02.005>



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### REVIEW

#### Ketamine as treatment for post-traumatic stress disorder: a review

Felix Liriano<sup>1</sup>, Candace Hatten MD<sup>2</sup>, Thomas L Schwartz MD<sup>1</sup>

<sup>1</sup>College of Medicine, SUNY Upstate Medical University, Syracuse, NY 13210, USA; <sup>2</sup>Department of Psychiatry and Behavioral Sciences, Montefiore Medical Center, Bronx, NY 10467, USA

# KETAMINE AS A THERAPEUTIC

**Intravenous**

**Intramuscular**

**Oral**

**Intranasal : J&J/ Janssen received FDA approval for eskatamine (Spravato) March 2019**

**Only available at “ Approved Centers”**

**Must have failed two antidepressants**

**Administered with a third antidepressant**

**Patients stay in office, device does not leave office.**

# 1891 Trials for PTSD in Progress Approximately 200-400 for various drug therapies., others psychosocial

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